SHEPARDSON

A hospital

Architecture

M. Arch.

1910

A HOSPITAL

BY

RALPH STEELE SHEPARDSON
B. S. UNIVERSITY OF ILLINOIS, 1897

THESIS DESIGN

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE

DEGREE OF

MASTER OF ARCHITECTURE

IN

THE GRADUATE SCHOOL

OF THE

UNIVERSITY OF ILLINOIS

1910

UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

May 12. 1910. 190

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

Ralph Steele Shepardson

ENTITLED A Hospital

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF Master of Architecture

J. W. Lease.

In Charge of Major Work

N. Clifford Ricker

Head of Department

Recommendation concurred in:

N. Clifford Ricker
A. P. Carman
Edward C. Schmidt

Committee on Final Examination

HOSPITALS.

The definition of the word hospital, according to Webster's dictionary is: "A building in which the sick or infirm are treated; a public or private institution founded for the reception and cure or the refuge of persons diseased in body or mind or disabled, and in which they are treated at their own expense, or more often by charity in whole or in part".

Hospitals are classified roughly as General and Special: General hospitals are for medical and surgical diseases that are not contagious or infectious, and Special hospitals are for the following requirements:

Children

Lying-in Women

Fever

Diseases of Women

Eye, Ear and Throat

Insane

Tuberculosis, etc., etc.

Large sized hospitals are those having 100 beds or more. Medium sized hospitals are those with 25 to 100 beds. Cottage or village hospitals have 25 or less beds.

The establishing of hospitals dates back to the time of Christ or before. History indicates that the origin of the first hospital was due to religion rather than to medicine.

Detailed information regarding early hospitals is lacking but among the earliest hospitals on record is the one founded by Valens in Caeserea about 370-80 A. D.

The proper idea during the Middle Ages seemed to be to collect as many patients as possible in large halls. This rendered supervision of the sick easy. The large hospital at Milan accommodated 3500 patients. The crowding of the sick together in this manner with improper ventilation is recognized as a mistake, as it tends to make a high mortality rate.

In England the earliest hospitals recorded were in the time of Lanfranc, Arch-bishop of Canterbury, who in 1080 A. D., founded two: one for leprosy, and one for ordinary diseases. During the eighteenth century, between 1810 and 1797, there were constructed in England and Ireland some fifty hospitals, marking the first great movement toward hospital construction.

In America the earliest hospital of any note was the Pennsylvanian Hospital of Philadelphia, which was started under the direction of Benjamin Franklin and others in 1755. It was in Philadelphia also that the first pavilion hospital was started in 1860.

There was a great movement in hospital construction in the United States at the outbreak of the Civil War, or about that time, and the work of organizing and constructing hospitals has advanced continuously ever since, until it has developed to such an extent that nearly every city has one or more hospitals. Large industrial institutions have hospitals in connection with their business, for

the care of their employees when sick or injured. In 1903 there were at least 2500 hospitals in this country, not including private institutions.

To find the quality of work that a hospital is doing, whether of high order or not, we should look at the mortality rate, which should be as low as possible, and which can be maintained lower in a properly constructed building under ideal conditions. One of the important questions to be considered in building a hospital is to make it fireproof, or as nearly so as the sum of money to be expended will permit. If the building cannot be of fireproof construction, it should then be not more than one or two stories in height. It is far better to sacrifice ornamentation of the exterior, or expensive material both inside and out, if by so doing we can approximate fireproof construction, providing we remain within the practice of good architecture in matters of sanitation, ventilation, etc.

The interior should be designed with as few places for dust to lodge as is possible. The angles where vertical walls meet, those made by walls and ceilings and also by walls and floors should be rounding, rather than sharp, in order that they may be more easily kept clean.

The heating and ventilating should be carefully handled by an experienced heating engineer, so that proper amounts of fresh air at the proper temperature will be assured for all rooms, and in such volumes and rate of movement that there will be no drafts in the various rooms and wards.

The plumbing fixtures and pipes and fittings should be only the best; simple in design so they may be easily cleaned and kept in a sanitary condition.

The matter of sunlight is a most important item to be considered in selecting a site and in locating the hospital on the site. The ideal building should be designed and located so that the maximum number of rooms will receive the maximum amount of sunlight and fresh air each day; also the building should be so placed that it may receive the greatest possible air circulation in and around it.

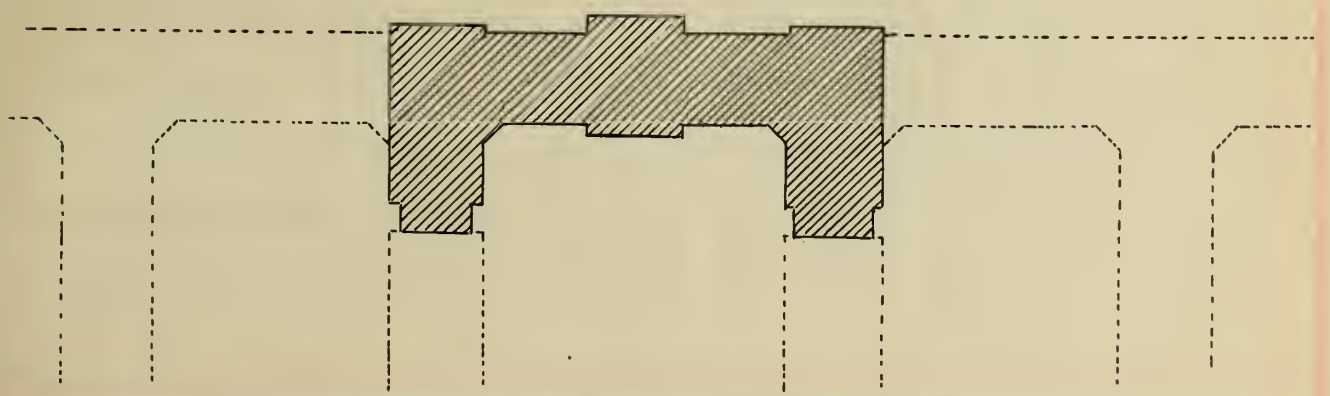
The Surgical Society of Paris at one time appointed a committee to study and report on the proper area of site per patient in the hospital. After some deliberation they reported as their belief that not less than 60 square yards per patient should be considered. Of course in cities, hospitals located in congested places do not approximate this minimum of 60 square yards; but a great many hospitals do and many have considerable more space per patient. As a comparison of what the above committee reported, and what we find in existing hospitals, I give the following examples:

St. George's Hospital	12 square yards per patient
New York "	30 " " " "
Leeds Hospital	56 " " " "
St. Thomas "	70 " " " "
John Hopkins "	186 " " " "

Sir Douglas Galton recommends more area per patient, he placing the area at about 100 square yards or about 50 patients per acre of grounds.

In placing a hospital on a lot near another building, the distance between the two buildings should be at least twice the height of the taller building, which will permit air circulation and opportinity for the benefits from the sun.

The ideal building to procure the greatest amount of air and sun light is a rectangular shaped building, located with the major axis either south-west to north-east or south-east to north-west; as with this shaped building every room would receive sun at some time during the day, and there would be no interior angles in the outside wall, which would interrupt the moving currents of air and cause dead air spaces; but with the "U" shaped building we can get practically the same results regarding the sunlight, and nearly as much air movement, when the projections are not too great and are at some considerable distance apart. Architecturally the "U" shaped building can be made more pleasing, and will permit of future additions and extensions in a more pleasing and practical manner as shown by the sketch. The full lines show the original building and the dotted lines the future additions.



The architect and building committee in planning and considering the plans of a hospital should consider the future growth of the organization, and the necessity of enlarging the building at some future time when needs require. In selecting a lot and placing the building on the lot this matter should receive their joint consideration.

The amount of bed space in relation to population varies with the different authorities; it varying from 4 beds to 1000 population in London to 2 beds to 1000 population in America, while one authority places the number of beds per 1000 population at 10. . In 1903, Massachusetts had one bed to every 150 persons.

The building should be located so that it will be isolated from neighboring noises, dust, smoke and adjoining firerisks. as far as practical, and still be within easy access for doctors to attend the sick and for patients to get there. The ideal location would be in the country, but owing to the difficulty in getting there it had better be located in or near a town.

The advantages of a several-storied building over the cottage type of the same capacity on a lot of a certain restricted size, such as a city block, are better light and air circulation. The upper stories would be particularly free from dust, noises and smoke. The several-storied building could be located back from the street, and by so doing there would be eliminated dust and noise; while the one story type would necessitate the location of some of the buildings considerably closer to the source of the annoyance.

It would no doubt be more economical to build a large hospital with several stories, than a hospital of the one story type having an equal amount of accomodations. This would permit, with a fixed appropriation, of building a better class of building, if of the several story type.

Masonry should be of a material as impervious as possible, and of a kind that will be as nearly self-cleaning during rains as can be procured, and still not absorb moisture. Foundations and basement floors should be thoroughly water-proofed to avoid dampness.

Exterior walls should be furred with hollow tile, and painted with a water-proofing and then plastered directly on the furring with cement plaster. The partition walls might be of hollow tile with plaster directly on the tile or be of metal studs and metal lath and plaster.

Floor construction if possible should be of reinforced concrete or hollow tile arches, and having a finished floor of tile, mosaic, marble, etc., in the rotunda, offices, operating roors, toilets, halls, parlors, etc. All bedrooms and wards are better with narrow maple flooring placed on strips of wood laid on the concrete or hollow tile arches, as the cement or tile floors are too cold to walk on with the bare feet.

All inside trim and doors in the building should be free from all dirt collecting angles, and of a material treated so that it will not absorb dirt or moisture, either of hardwood or metal clad. The metal clad doors and trim minimize the firerisks.

In corridors, in openings having glass, such as transoms, elevator openings, stairways, or corridor divisions, the glass used should be wired

glass,owing to its fire retarding virtue.

All stairways should be enclosed and cut off from the corridors on account of safty from fire and the openings should be glazed with wired glass as noted above. The stairs should be constructed of some fire proof material such as iron or reinforced concrete with treads and risers of metal, marble, slate, etc.

Wainscoting in halls, toilets, etc., could be of tile, marble, or glass. Walls of operating rooms had better be of large sheets of glass set in cement, the entire height of the walls. Toilet rooms having partitions between fixtures had better have these partitions of marble, glass or slate.

Hospital plumbing should be only of the best material and of the most modern design, and should be properly installed so as to guard the inmates against unhealthy sewer gases and foul conditions. All fixtures should be selected bearing in mind easy-cleaning and non-absorbing qualities, so that the attendant can easily get at all parts of the fixture.

Hot and cold water supplys to all fixtures should be of ample size to permit an abundance of water at the fixtures when needed. The waste to the fixture should be of the size that they will perform their duty quickly but not be so large that they will not be self-cleaning.

A brief description of the various fixtures and appliances for the plumbing of a hospital will follow:

Water Filter:- This is usually a cylindrical shaped vessel in which is placed charcoal, sand, or gravel or both, so that the water percolates through the voids and pores, depositing some or all of its impurities.

Garbage Crematories and Water Heaters:- These are for destroying soiled bandages, papers and materials that would accumulate about the hospital and be a menace to health. In burning the refuse, to which is added other fuel to make it burn more readily, the heat created is also used to heat water in the the crematory for supplying the building.

Bath Tubs:-These should be of a smooth non-porous material, either of porcelain or enameled iron, with the base going down below the top of the finished floor line. Tubs should be set free from the wall so that all parts both on the outside and inside can be kept free from dirt.

Water Closets:-Water closets of the wall type, which leaves the floor underneath free are probably the best type. The bowl of the closet should be of smooth vitreous ware, and the seat of enameled iron or aluminum, since they can be easily cleaned with hot water, soap, etc., without injuring the finish.

Slop Sinks:-These should be of porcelain or enameled iron with a stopper at the outlet. Slop hoppers should be of vitreous ware, with pedal valves for discharging the contents of the bed pans, etc., at once.

Shower Baths:- Shower baths may be equipped with only the head shower or the baths may be very much more extensive. Showers in the simple form should be placed over all tubs, but in the toilet rooms the showers should be fully equipped. In the Hydro-Therapeutics room the equipment should be complete having a control table, needle and shower baths, shampoo tables, electric baths, scales, vapor baths, rubbing slabs, etc.

Sinks:- In operating rooms the sinks should be of enameled iron or

of vitreous ware, with pedal valves for procuring hot and cold water as desired and also for discharging the contents of the bowl.

Lavatories:- These should be of porcelain, vitreous ware or enameled ware and better be of a type that they may be cleaned over their entire surface. They should be placed in the private baths and the toilet rooms.

In the kitchen should be placed kitchen sinks, vegetable sinks, pantry sinks, etc., of the best of vitreous or enameled ware. The pantry sinks may be of copper in German silver.

Laundry trays can be of soap stone or of enameled iron.

Drinking fountains are best of vitreous ware. They can be of the wall type or of the pedestal type. They should be connected to the waste and vent system, and should be supplied with water that has passed through the refrigerating system, and this supply should be circulating so that cold water will be at the fixture immediately.

In the laundry should be placed sterilizers, washers, extractors, soap tanks, wash tubs, starch cookers, starching machines, dryers, mangles, body ironers, etc.

It is much better to have the laundry in another building than the hospital proper; due to the odors passing from the laundry into and throughout the building. We have located the laundry in our problem on the lot at the rear and at some distance from the hospital. In the Woman's Hospital, in the City of New York, the laundry is in the top story up in the roof. The kitchen, pantry, and other departments that are objectionable to to have in the building proper are located upon the top floor.

All exposed pipes should be of nickel-plated brass piping; and all wastes from fixtures should be trapped and the traps vented.

Sterilizers should be in the sterilizing rooms, adjoining the operating rooms, for sterilizing bandages, dressings, instruments, etc. used in the operations. In the kitchens and diet kitchens should be placed sterilizers for sterilizing foods. In the fumigating room in the bases there should be placed disinfectors for disinfecting bedding, clothing, etc.

It is quite necessary now to install a vacuum cleaning system in a building of this character, as in this way all the dust is removed directly from the rooms without causing it to scatter around the room as is the case with the old method. There are a number of different systems of vacuum cleaning on the market now: The portable one which you take into the room and connect to an electric outlet, and one with a central plant in the basement and air pipes leading to the various rooms or halls as desired. In a building of this size a central plant would be the more practical.

Furniture should be of the simplest form, free from carving or dirt-catching projections; and it should also be non-absorbing. Window hangings should not be permitted in wards, rooms, toilets, etc.

The subject of ventilation has been under study for a great many years and after all the effort expended on this subject, there seems to be yet considerable disagreement as to the best methods. As early as the fifteenth century an investigation was started with

a view to installing a system of ventilation for supplying fresh air in the mines of Saxony. This, however, was a very crude beginning. The first experiment in the ventilation of buildings was under Sir Christopher Wren in the House of Parliament in 1660. It was not until 1849 that the matter was taken up in the United States, when the ventilation of Representatives' Hall of the Massachusetts House of Representatives was investigated.

The air in the room should be kept as nearly as possible of the same quality as the exterior air. Parkes in his work on Practical Hygiene writes: "Although the establishment of hospitals is a necessity, and marks an era of an advanced civilization, it must always be remembered that, if the crowding of healthy men has its dangers, the bringing together of many sick persons within a confined area is far more perilous. The risks of contamination of the air and of impregnation of the materials of the building with morbid substances, are so greatly increased that the greatest care is necessary in order that hospitals shall not become pest houses and do more harm than good. We must always remember that a number of sick persons are merely brought together in order that medical attendance and nursing may be more easily and perfectly performed. The risks of aggregation are encountered for this reason; otherwise it would be far better that sick persons should be separately treated, and that there should be no chance that the rapidly changing and in many cases putrefying substances of one sick body should pass into the bodies of the neighboring patients. There is a continual sacrifice of life from diseases caught in, or aggravated by hospi-

tals. The many advantages of hospitals more than counterbalance this sacrifice; but it should be the first object to lessen the chance of injury to the utmost. The risk of transferance or aggravation of disease is least in the best ventilated hospitals. A great supply of air, by immediately diluting and rapidly carrying away the morbid substances evolved in such quantities from the bodies and excretions of the sick, reduces the risk to its minimum, and perhaps removes it altogether."

The proper ventilation of a hospital is more important than that of any other building, as the occupants are in a sick, weak and feeble condition; and by proper ventilation, the mortality rate will be lowered as well as the average time in which to obtain a cure decreased. This in turn will increase the working capacity of the institution. As an example, at the Smith Infirmary on Staten Island, two wards were taken, with and without ventilation. The patients admitted to each ward were of the same class, suffering to a great extent from the same diseases; the results obtained were that the patients in the ventilated ward averaged ten days to effect a cure, while in the other and unventilated ward, the avergae was sixteen days to effect a cure. The temperature of the room should be kept at 68 degrees to 70 degrees Fahr. Operating rooms should be maintained at a higher temperature. The amount of air per minute per person, to be supplied for various rooms, is:

Ordinary wards	60	cu.ft. per minute
Surgical "	60 -100	" " "
Operating Rooms	100	" " "

The average is 4000 to 6000 cu.ft. of air per person per hour.

Fresh air should be forced into the wards, operating rooms, and private rooms, From the toilets, diet kitchens, kitchens, etc., the air should be drawn out and warm fresh air brought in by ducts of proper design and size so that any air passing between rooms and corridors, will pass out from the rooms occupied by the sick and air passing from the corridors would pass into the room where the odors originate and not vice versa.

The best system of heating for hospitals is steam equipped with temperature regulators, due to the fact that immediate results may be obtained in sudden changes of temperature; with direct radiation in the corridors, toilets, kitchen, etc., and indirect radiation in the wards, private rooms, operating rooms, etc.

For refrigerating purposes, the mechanical or artificial method is much better than the natural method of having ice in the coolers. We can obtain a lower temperature and a dryer air in the cooler by using the mechanical system. There are three general methods of mechanical refrigeration using condensed ammonia: 1st. by circulating through the pipes directly to the cool rooms; 2nd. by cooling brine and circulating it in pipes through the cool rooms; or 3d. by cooling air and circulating it through the cool rooms.

Air coolers for regulating the temperature of the various rooms can be used in connection with the ventilating system in extreme hot weather or in fever cases, but it is expensive in maintainance, and is little used in hospitals at the present time.

A complete and perfected signal system for signaling the nurse from the various beds should be installed. This should be noiseless in opera-

tion and positive, possibly a series of electric lamps of various colors, for various signals, which can be seen from all stations and in the corridors. There are several systems of signals on the market.

Telephones should be installed in the building so that all departments may communicate with each other

Summary of the problem:-

Basement Floor.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Emergency rooms	2	4	468	117
Male Help's Bed rooms	4	6	762	127
Female " " "	11	17	1812	107
Male Help's Toilet	1		234	
Female " "	1		270	
Help's Dining room	1		300	
Boiler, Coal and Shop rooms	3		1668	
Store rooms	4		722	
Fan rooms	2		504	
Laboratory	1		300	
Nurse's Class room and Pantry	2		360	
Emergency and Accident room	1		270	
Patient's Locker room	1		330	
Sitting rooms	2		816	
Autopsy	1		196	
Morgue	1		140	
Bandage room	1		48	
Fumigating room	1		80	
Staircases	2		468	
Bath room	1		68	
X-Ray room	1		130	

Basement Floor, Cont.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Elevators ...	2		86	
Pantry Kitchen	1		150	
Drug room	1		72	
Vault	1		25	
Entry	1		109	
Halls and Corridors	2		2448	
Total	51		12800	

Percentage of various rooms to total basement area:-

Halls and Corridors	19.1 per cent
Emergency rooms	3.66 " "
Male Help's bed rooms	3.9 " "
Female's " " "	14.1 " "
Toilet rooms	4.4 " "
Boiler, Coal and Shop rooms	18.0 " "
Staircases	3.7 " "
Store rooms	3.9 " "

First Floor.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Offices	2		288	
Vault	1		25	
Doctors' Parlor	1		216	
Reception room	1		345	
Nurses' Parlor	1		345	
Children's Six Bed wards	4	24	1680	70
Two Bed wards	2	4	504	126
One Bed ward	15	15	2463	164
Nurse's Duty and Bed room	2	2	504	252
Diet Kitchen	2		900	
Solarii	2		816	
Staircases	2		468	
Toilet rooms	4		738	
Private Baths	4		192	
Drugs	1		90	
Public Toilets	2		90	
Elevators	2		86	
Halls, Vestibule, Entry, Etc.	____		3483	
Total	48		12583	

First Floor, Con't.

Percentage of various rooms to total of first floor area:-

Halls, Vestibule, Entry, Etc.,	27.4 per cent
Offices, Reception rooms, and Parlors	9.7 " "
Six Bed wards	13.4 " "
Two " "	4.0 " "
One " "	19.7 " "
Diet Kitchens	2.4 " "
Solarii	6.5 " "
Staircases	3.7 " "
Toilet rooms	5.9 " "
Private Baths	1.5 " "

Second Floor.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Six Bed wards, Surgical	2	12	840	70
" " " , Medical	2	12	840	70
Two " "	5	10	1401	140.1
One " "	19	19	3192	168
Surgical Dressing room	1		284	
Nurse's Duty and Bed room	2	2	504	252
Diet Kitchen	2		300	
Solarii	2		816	
Staircases	2		468	
Toilet rooms	4		738	
Private Baths	4		192	
Drugs	1		84	
Elevators	2		86	
Halls and Corridors	3		2880	
Total	51		12575	

Second Floor, Con't.

Percentage of various rooms to total second floor area:-

Halls and Corridors	28.0 per cent
Six Bed wards, Surgical	6.7 " "
" " " , Medical	6.7 " "
Two Bed "	11.2 " "
One " "	25.5 " "
Diet Kitchen	2.4 " "
Solarii	6.5 " "
Staircases	3.7 " "
Toilet rooms	5.9 " "
Private Baths	1.5 " "

Third Floor.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Six Bed Ward, Surgical	2	12	840	70
Two " "	5	10	1401	140.1
One " "	17	17	2713	159
Surgical Dressing room	1		234	
Hydro-Therapeutics	1		234	
Nurse's Duty and Bed room	1	1	252	252
Nurses' Bed rooms	8	12	1272	106
Diet Kitchen	2		300	
Solarii	2		816	
Staircases	2		468	
Toilet rooms	4		738	
Private Baths	4		192	
Drugs	1		84	
Elevators	2		86	
Halls and Corridors	3		2880	
Total	55		12510	

Third Floor, Con't.

Percentage of various rooms to total third floor area:-

Halls and Corridors	23 Percent
Six Bed Wards, Surgical	6.7 " "
Two " "	11.2 " "
One " "	21.7 " "
Diet Kitchens	2.4 " "
Solarii	6.5 " "
Staircases	3.7 " "
Toilet rooms	5.9 " "
Private Baths	1.5 " "
Nurses' Bed rooms	10.2 " "

Fourth Floor.	No. Rooms.	No. of Beds.	Total no. Sq. Ft. in Rooms.	Av. No. Sq. Ft. Floor per Bed.
Two Bed Maternity ward	1	2	165	82.5
One " " "	4	4	612	153
Nursery ward	1	6	625	104
Recovery rooms	2	4	418	104
Clean Operating rooms	3		720	
Maternity " "	1		210	
Pus " "	1		247	
Sterilizing rooms	2		130	
Bandages, Instruments, Etc.	4		249	
Anasthetizing rooms	2		222	
Doctors' Waiting room	1		120	
Doctors' Scrub rooms	2		350	
Internes' Bed rooms	6	6	810	135
Nurses' " "	11	15	1688	112
Toilet rooms	3		536	
Private Baths	2		96	
Elevators	2		86	
Solarii	2		840	
Kitchens, Diets, Pantry, Etc.,	5		1191	
Nurses' Dining room	1		625	
Kitchen Stock room	1		112	
Linen room	1		112	

Fourth Floor, Con't.

Halls and Corridors	3	2445
Total	62	12609

Percentage of various rooms to total fourth floor area:-

Halls and Corridors	19.4 per cent
Maternity Bed rooms	6.1 " "
Clean Operating rooms	5.7 " "
Maternity " "	1.6 " "
Pus " "	1.9 " "
All five Operating rooms	9.3 " "
Entire operating department, including Operating rooms, Sterilizing rooms, Anaesthetizing rooms, Bandage rooms, etc.	14.1 " "
Internes' Bed rooms	6.4 " "
Nurses' " "	13.4 " "
Solarii	6.7 " "
Kitchen, Pantry, Etc,	9.4 " "
Nurses' Dining room	4.9 " "

Recapitulation of beds on each floor.

	One Bed ward	Two Bed ward	Six Bed ward
Basement		4	
First Floor	15	4	24
Second "	19	10	24
Third "	17	10	12
Fourth "	4	2	6
Total	55	30	66

Total of all beds in the building 151

Name of Hospital	No. of Beds.	Gen. Wards.		Small Wards.		Per Cent of Beds in Wards of One and Two Beds Each to Total Number.
		No. of Wards.	No. Beds in Each.	No. of Wards.	No Beds in Each.	
Johns Hopkins	361	10	24	1 27 64	3 2 1	22.6
Hamburg	1340	30 11	30 14	11 11 119	4 2 1	10.5
Herbert	650	15 5 1	32 28 20	8	1	1.2
St Thomas	573	15 3 7	28 20 8	17 3	2 1	6.4
Thesis Subject	151	11	6	15 55	2 1	56.3

Recapitulation by floors

	Sq. Ft. of floor area.	Sq. Ft. Devoted to beds on each floor.	Percentage of total area devoted to beds.
Basement	12800	468	3.66 Per cent
First Floor	12583	4647	37.2 " "
Second "	12575	6273	50.2 " "
Third "	12510	4944	39.6 " "
Fourth "	12609	1820	14.4 " "
Total	63077	18152	28.8 " "

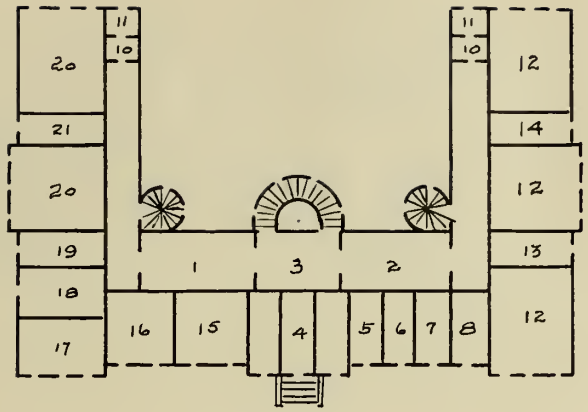
Total number of attendants of all kinds and departments 56

There is accommodation for one Interne per 25 patients.

" " " " " Nurse " 5.6 "

There is an average of one attendant per 2.68 "

The following sketches are a few of the hospitals now in existence, most of which are along the lines of my problem; that is of the U-shaped type.



Eye and Ear Clinic at Halle.

1- Eye Clinic vestibule.

2- Ear " "

3- General Ante room.

4- Lecture room.

5- Anatomical Examination room.

6- Director Ear Clinic.

7-8- Asst. Directors.

9- Corridors.

10- Closets.

11- Bath rooms.

12- Wards for Ear Patients.

13- Resting and Tea room.

14- Waiting room.

15- " " for Eye Patients.

16- Ordination room.

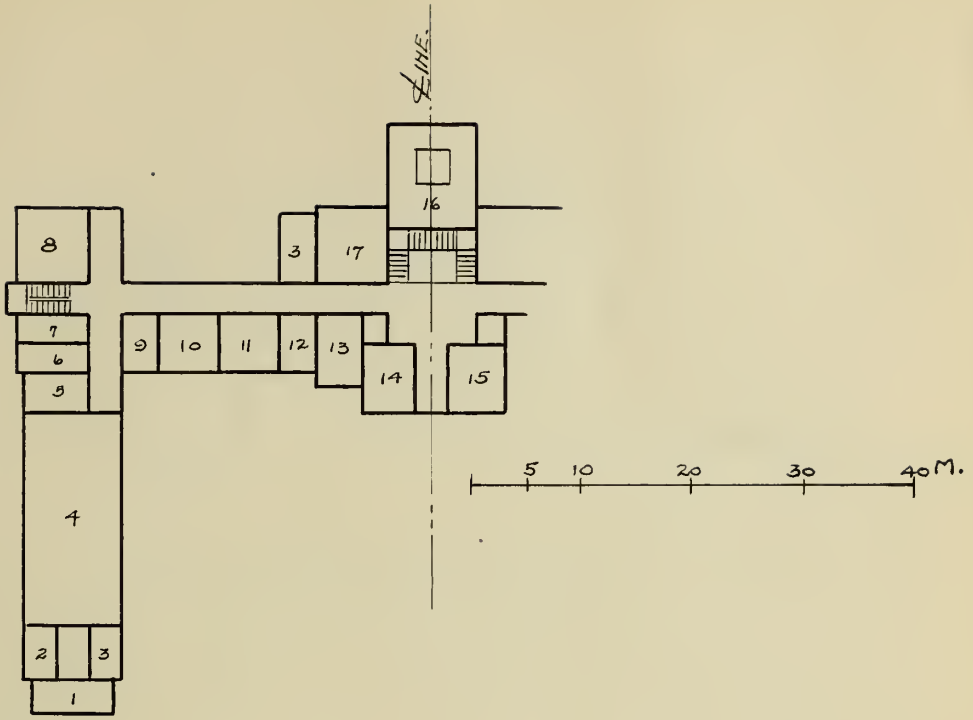
17- Light Examination room.

18- Dark " "

19- Isolation room.

20 Sick Wards.

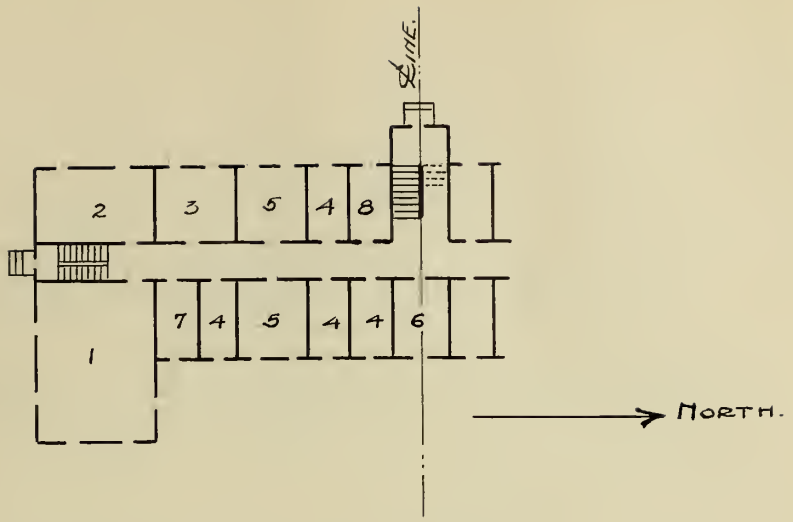
21- Diet Kitchen.



Hospital, "Bergmannstrost", Halle, Germany.

1- Solarium.
2- Bath room.
3- Toilet.
4- 25 bed ward.
5- Waiting room.
6- Diet Kitchen.
7- Bandage room.
8- Ward.
9- Isolated room.
10- Bandage room.
11- Operating room.
12- Doctor's room.
13- " "
14- " "
15- Reception room.
16- Operating room.
17- Bandage room.

The planning of this hospital incorporates the corridor system. This arrangement permits of a very good grouping of the rooms.



Herzogliche Hospital in Braunschweig.

1- Six bed ward.

2- Day room.

3- Bath.

4- Single Bed ward.

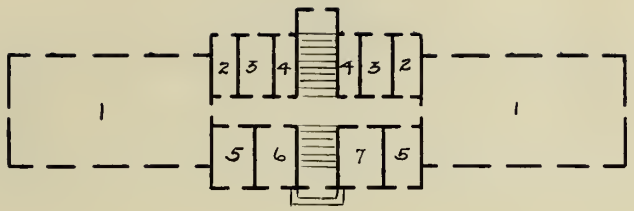
5- Two " "

6- Operating room.

7- Waiting room.

8- Diet.

This building is for the treatment of Scarlet Fever and Diptheria and is a detached building located on a plot of ground with other hospital buildings. It is two stories in height.



Pavilion Hospital in Madgeburg.

1- Sixteen Bed wards.

2- Light shaft.

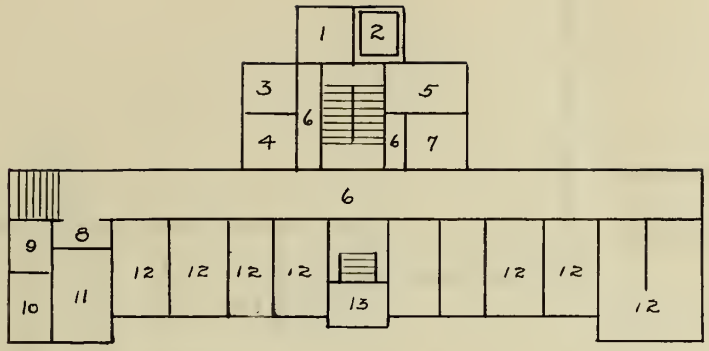
3- Toilets.

4- Diet.

5- Waiting room.

6- Private room.

The wings are two stories in height and the central portion is three stories in height.



1- Waiting room.

2- Sweat bath.

3- Toilet.

4- Bath.

5- Help-

6- Corridors.

7- Diet room.

8- Entry.

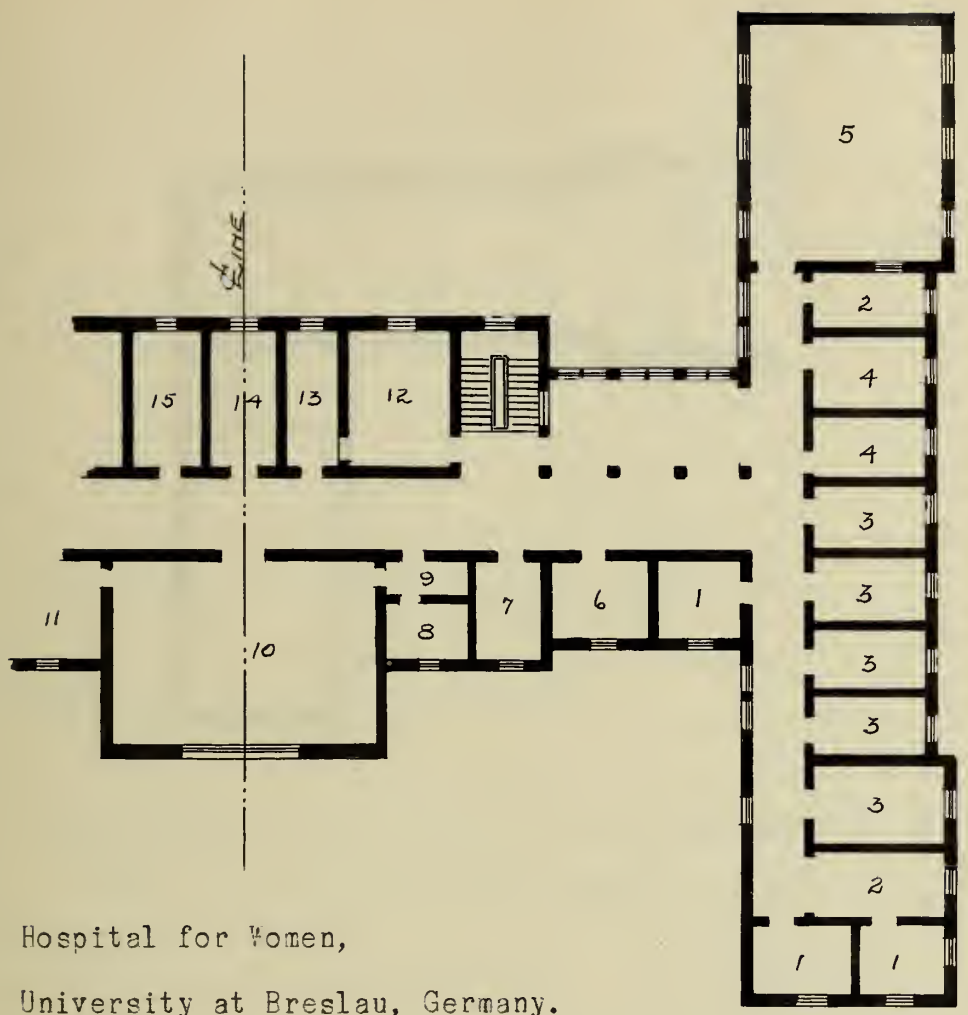
9- Attendant.

10- Assistant.

11- Resident Doctor.

12- Wards.

13- Entrance.

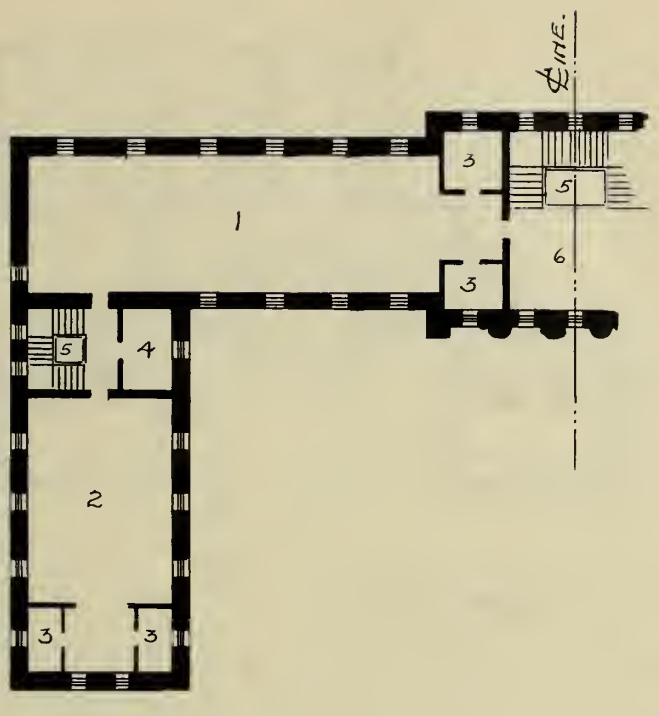


Hospital for Women,

University at Breslau, Germany.

1- Two Bed wards.
2- Duty room.
3- One Bed wards.
4- Bath rooms.
5- Ten Bed wards.
6- Isolated ward.
7- Sterilizing room.
8- Instrument room.
9- Ante room.
10- Operating room.
11- Preparatory room.
12- Surgeon room.
13- Asst. Surgeon.
14- Library.
15- Volunteers.

The building is in the form of the letter "H" having two stories and an attic. The are two stairways, one on either side a short distance from the center. On the first floor are the dispensary, poly-clinic, lying-in, baths, and four ten-bed wards. This floor is devoted to maternity cases.



Half Plan of Second Story of Royal Infirmary at Edinburgh.

1- Men's ward, 24 Beds, Size ~~of Ward~~ 26' × 81'

2- " " 12 " " " " 26' × 50'

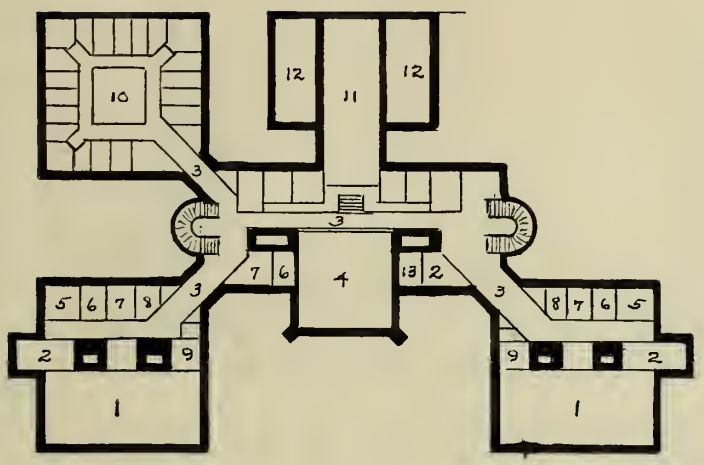
3- Private rooms. 5- Stairs.

4- Duty room. 6- Hall.

The right half is devoted to Women patients.

Edinburgh hospital consists of a body and two wings, each three stories high; the body is 210' long and the wings are 70' long.

The hospital will accommodate about 200 patients and was built in 1738. The objections to this plan are the large wards and the lack of private rooms.



Third Floor Plan of St. Luke's Hospital, New York City.

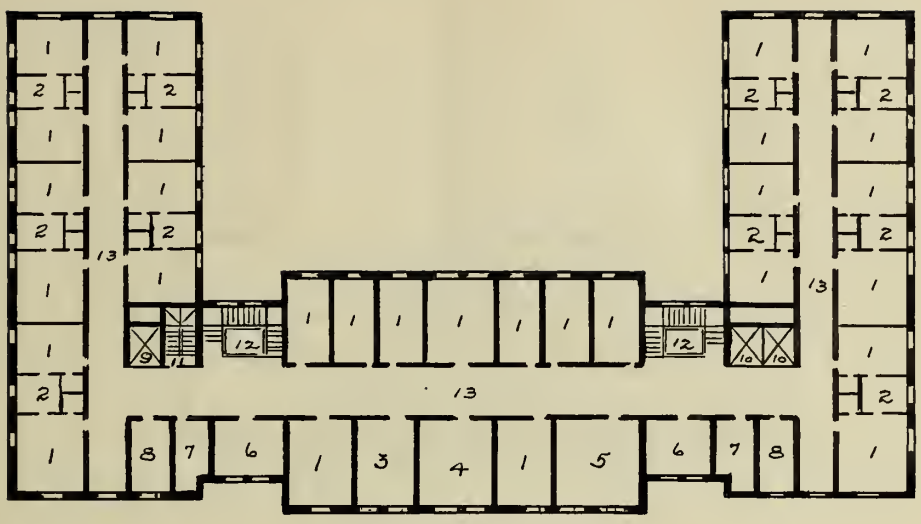
1- Twenty Bed wards. 5- Two Bed ward. 9- Nurse room

2- Toilets. 6- Quiet room. 10- Light shaft.

3- Corridors. 7- Dressing room. 11- Chapel (Upper part).

4- Children's ward. 8-Service room. 1e- Reception room.

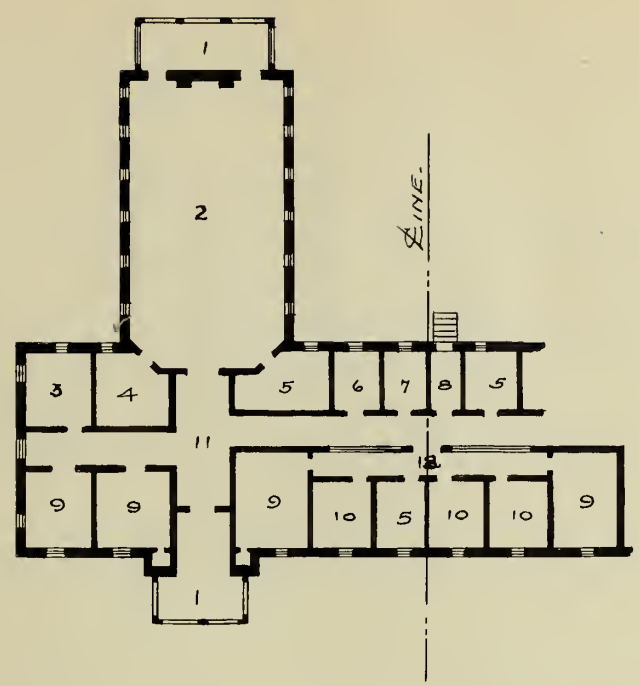
St. Luke's hospital on Cathedral Heights, New York City, is one of the more recent hospitals built in this country. The building is of the pavilion type, having five pavilions at present which will eventually be extended to ten. The administrative and children's ward pavilion is in the centre of the group. The building is six stories in height, including the basement or ground floor. The nurses and other employees are cared for in a building or pavilion by themselves. The kitchen is located on the fourth floor over the chapel. The large wards are 30' feet wide by 75 feet long and will accommodate 20 patients.



Third Floor Plan, Women's Hospital, New York City.

1- Private wards.
2- " baths.
3- Toilet.
4- Treatment room.
5- Parlor.
6- Serving room.
7- Bed-pan room.
8- Duty room.
9- Service Elevator.
10- Passenger "
11- Service Stairs.
12- Public "
13- Corridors.

The building is six stories and a basement in height and was built in 1906. The first floor is devoted to administration, while the nurses and employees are cared for on the second floor. The third floor is devoted to private pay patients, the fourth and fifth to two large wards, each with twenty beds and necessary service rooms. The top or sixth floor is in the roof and has the operating rooms, and kitchens, laundry, etc. The hos- will accommodate 125 patients, 40 nurses, 6 doctors and 32 servants.



Half Plan of Hospital at Bradford, Penn.

1- Solarii.

2- Medical ward.12 Beds.

3- Special room.

4- Nurse's room.

5- Toilet.

6- Linen.

7- Diet Kitchen.

8- Refuse.

9- Two Bed wards.

10- Private room.

11- Corridor.

12- Passage.

The Bradford hospital has

24 open ward beds

8 two-bed wards and

3 one-bed wards which make 19 practically private beds to 24 public beds.

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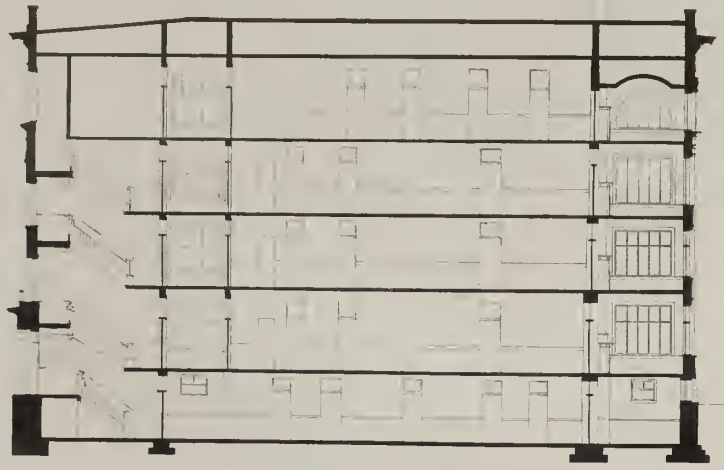

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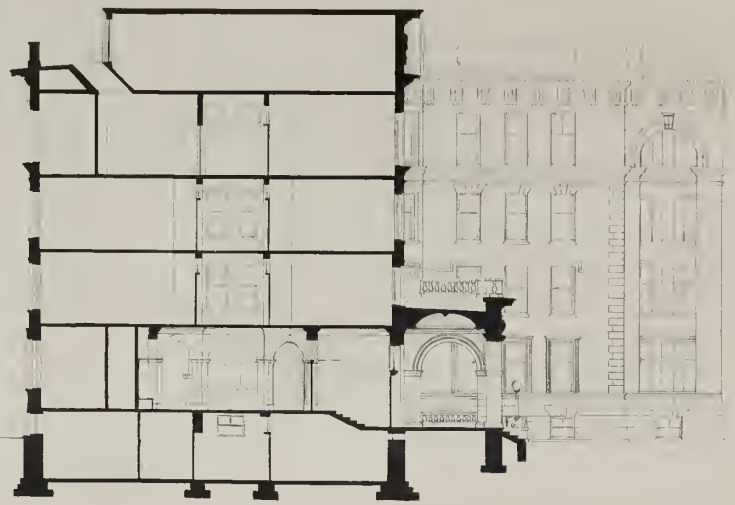

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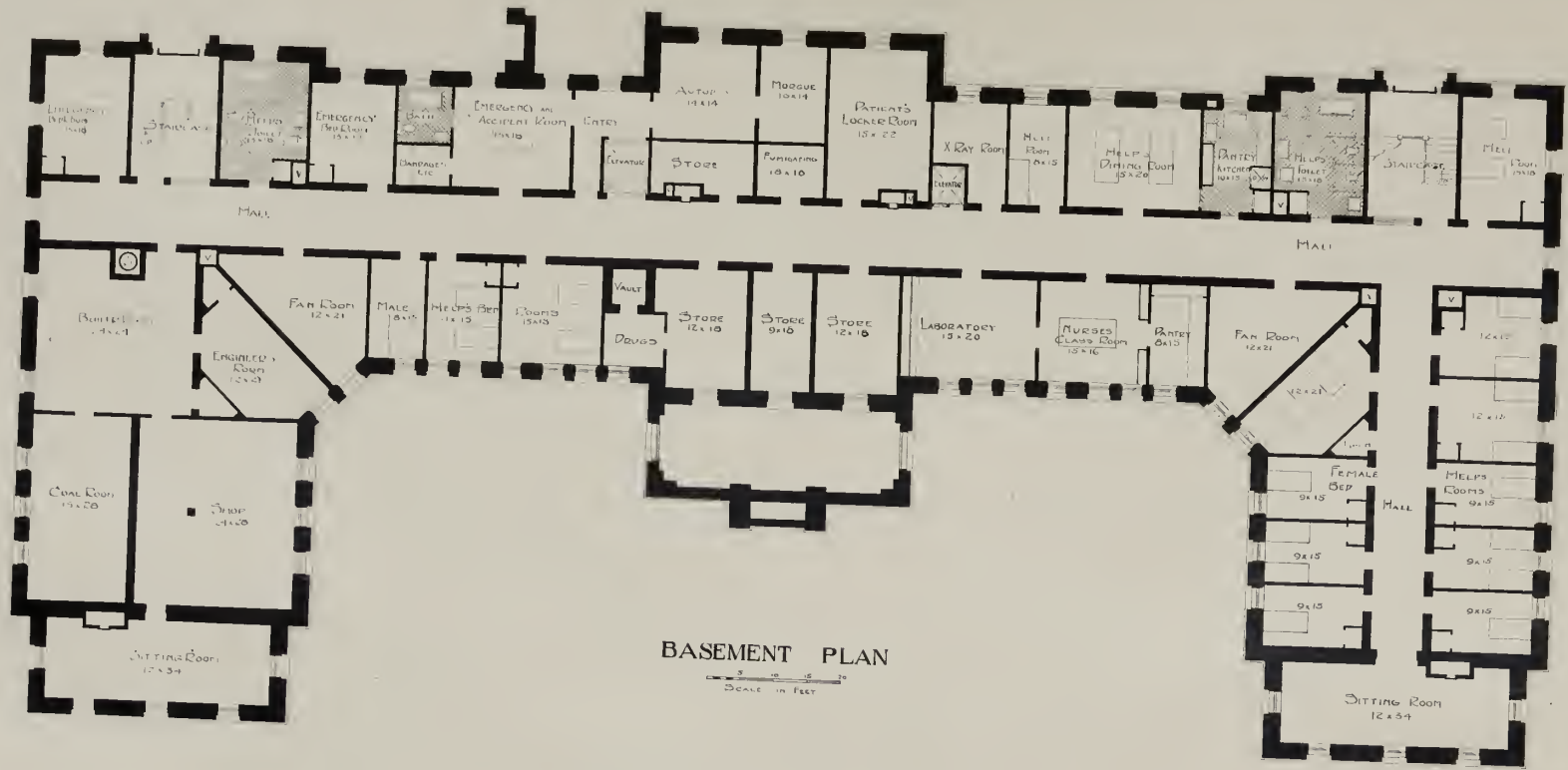

BASEMENT PLAN

Scale in Feet

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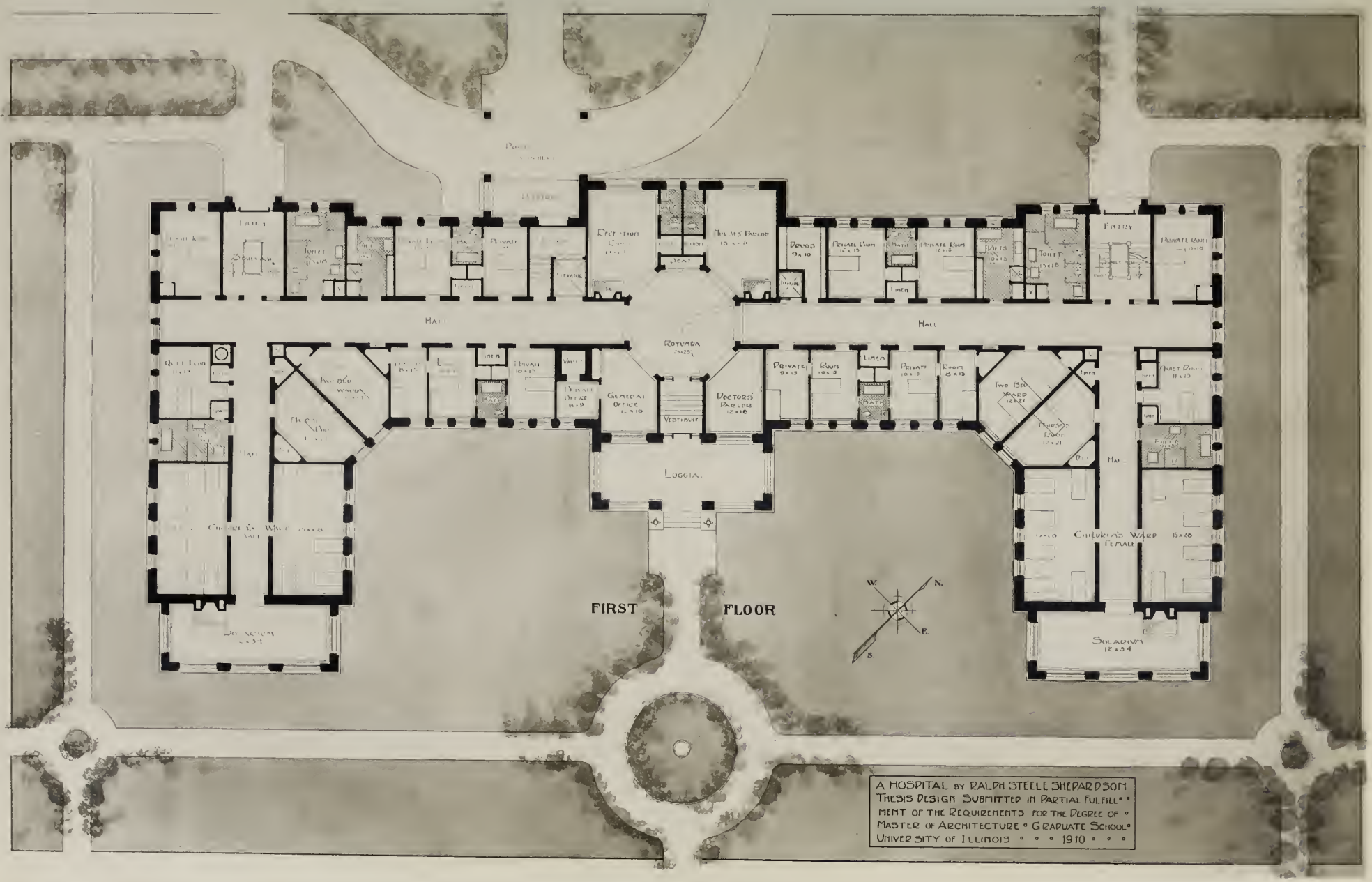

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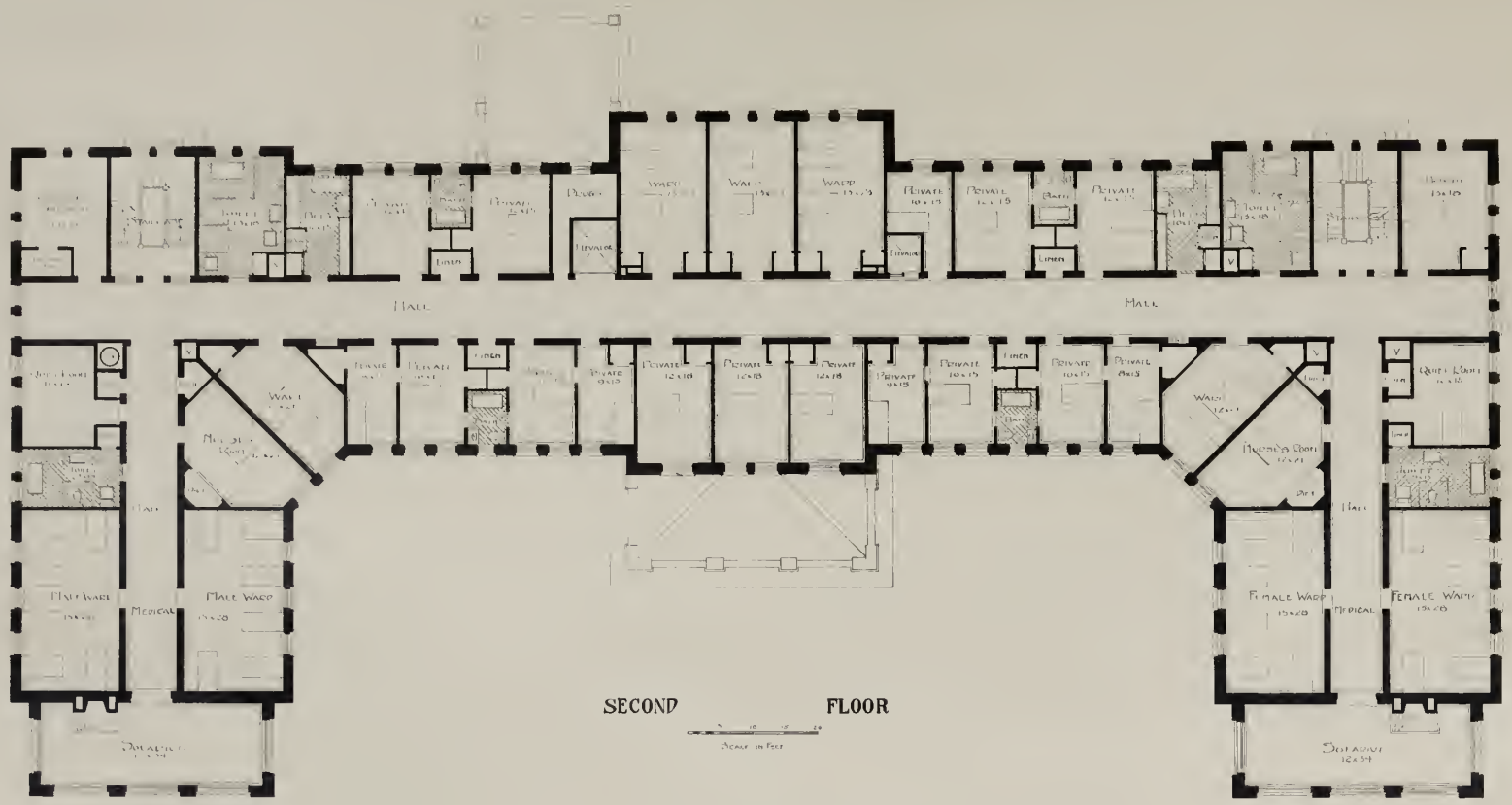

SECOND FLOOR

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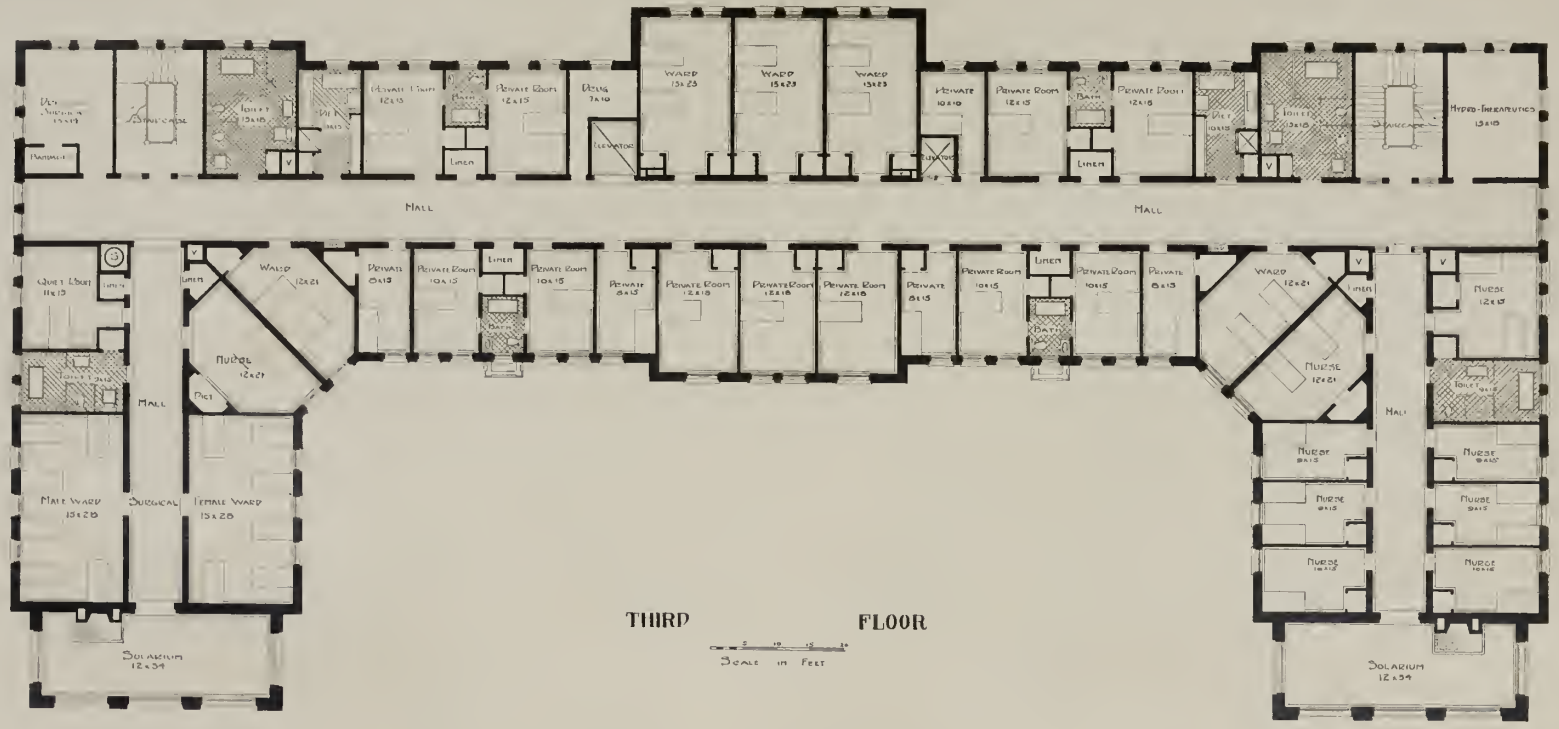

THIRD FLOOR

Scale in Feet

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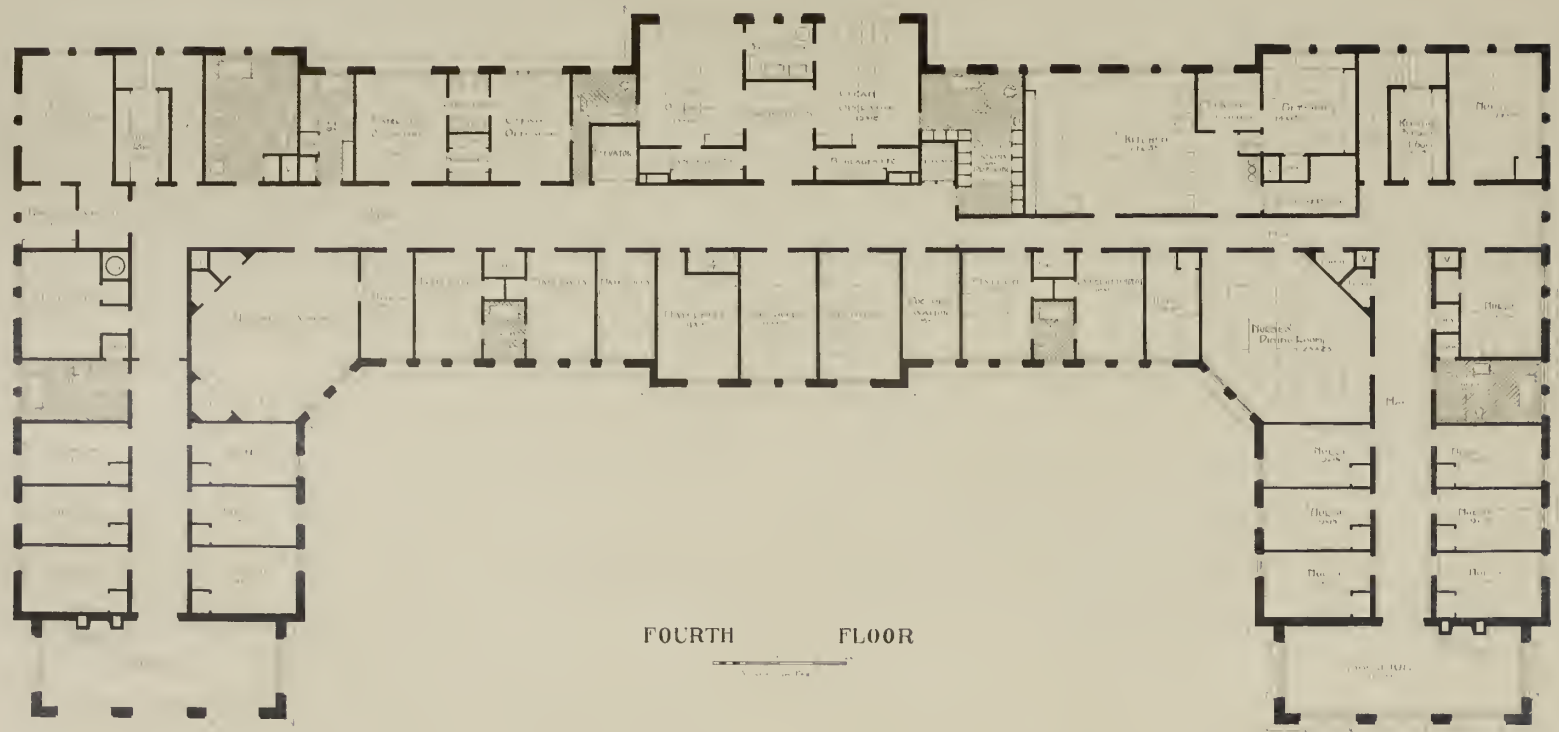

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